In the Claims

1. (Original) A method for transmitting information in an optical communication system, comprising:

modulating a non-intensity characteristic of an optical carrier signal with a data signal to generate an optical information signal;

transmitting the optical information signal over an optical link; and

amplifying the optical information signal over a length of the optical link with a co-launched amplification signal traveling in a same direction as the optical information signal in the optical link.

2. (Original) The method of Claim 1, wherein the co-launched amplification signal travels at a substantially same speed as the optical information signal.

3. (Original) The method of Claim 1, wherein the co-launched amplification signal comprises a wavelength lower than that of the optical information signal.

4. (Original) The method of Claim 1, wherein the optical information signal is amplified over the length of the optical link with the co-launched amplification signal by distributed Raman amplification (DRA).

5. (Original) The method of Claim 1, further comprising:

generating a plurality of optical information signals each comprising a wavelength distinct carrier signal having the non-intensity characteristic modulated with a data signal;

multiplexing the plurality of optical information signals to generate a wavelength division multiplexed (WDM) signal;

transmitting the WDM signal over the optical link; and

amplifying the WDM signal over the length of the optical link with a plurality of co-launched amplification signals transmitted in the same direction as the WDM signal.

6. (Original) The method of Claim 1, wherein the phase of the optical carrier signal is modulated with the data signal.

7. (Original) The method of Claim 1, wherein the frequency of the optical carrier signal is modulated with the data signal.

8. (Original) The method of Claim 1, further amplifying the optical information signal over a second length of the optical link with a counter-launched amplification signal traveling in an opposite direction as the optical information signal and the co-launched amplification signal.

9. (Original) The method of Claim 1, wherein the optical information signal and the co-launched amplification signal travel in the first direction, further comprising:

modulating the non-intensity characteristic of a second optical carrier signal with a second data signal to generate a second optical information signal;

transmitting the second optical information signal over the optical link in a second direction opposite the first direction; and

amplifying the first and second optical information signals over the length of the optical link with the co-launched amplification signal and a counter-launched amplification signal traveling in the second direction.

10. (Original) The method of Claim 1, further comprising:

remodulating the optical information signal with a transmission clock frequency using an intensity modulator to generate a multimodulated signal;

transmitting the multimodulated signal over the optical link; and

amplifying the multimodulated signal over the length of the optical link with the co-launched amplification signal traveling in the same direction as the multimodulated signal.

11. (Original) The method of Claim 1, further amplifying the signal in the optical link with a discrete amplifier.

12. (Original) The method of Claim 1, wherein the discrete amplifying comprises an erbium-doped fiber amplifier (EDFA).

13. (Original) An optical communication system, comprising:

an optical sender operable to modulate a non-intensity characteristic of an optical carrier signal with a data signal to generate an optical information signal;

an optical link operable to transmit the optical information signal; and

a distributed amplifier comprising a pump laser operable to co-launch an amplification signal traveling in a same direction as the optical information signal, the co-launch amplification signal operable to amplify the optical information signal over a length of the optical link.

14. (Original) The optical communication system of Claim 13, wherein the co-launched amplification signal travels at a substantially same speed as the optical information signal.

15. (Original) The optical communication system of Claim 13, wherein the co-launched amplification signal comprises a wavelength lower than that of the optical information signal.

16. (Original) The optical communication system of Claim 13, wherein the optical information signal is amplified over the length of the optical link with the co-launched amplification signal by distributed Raman amplification (DRA).

17. (Original) The optical communication system of Claim 13, further comprising:

the optical sender operable to generate a plurality of optical information signals each comprising a wavelength distinct carrier signal having the non-intensity characteristic modulated with a data signal, multiplex the plurality of optical information signals to generate a wavelength division multiplexed (WDM) signal and transmit the WDM signal over the optical link; and

the distributed amplifier comprising the pump laser operable to co-launch a plurality of amplification signals traveling in the same direction as the WDM signal, the co-launched amplification signals operable to amplify the WDM signal over the length of the optical link.

18. (Original) The optical communication system of Claim 13, wherein the phase of the optical carrier signal is modulated with the data signal.

19. (Original) The optical communication system of Claim 13, wherein the frequency of the optical carrier signal is modulated with the data signal.

20. (Original) The optical communication system of Claim 13, the distributed amplifier comprising a second pump laser operable to counter-launch a second amplification signal in an opposite direction as the optical information signal, the counter-launched amplification signal operable to amplify the optical information signal over a second length of the optical link.

21. (Original) The optical communication system of Claim 13, further comprising:

a second optical sender operable to modulate the non-intensity characteristic of a second optical carrier signal with a second data signal to generate a second optical information signal;

the optical link operable to transmit the second optical information signal in an opposite direction as the optical information signal; and

the distributed amplifier comprising a second pump laser operable to counter-launch a second amplification signal traveling in the opposite direction as the optical information signal, the co-launched amplification signal and the counter-launched amplification signal operable to amplify the optical information signal and the second optical information signal over the length of the optical link.

22. (Original) The optical communication system of Claim 13, further comprising:

the optical sender operable to remodulate the optical information signal with a transmission clock frequency using an intensity modulator to generate a multimodulated signal;

the optical link operable to transmit the multimodulated signal; and

the co-launched amplification signal operable to amplify the multimodulated signal over the length of the optical link.

23. (Original) An optical information signal propagated in an optical link, comprising:

a data signal modulated onto a non-intensity characteristic of an optical carrier signal; and

the optical information signal comprising a plurality of photons absorbed from a co-launch amplification signal by a Raman effect.

24. (Original) The optical information signal of Claim 23, wherein the non-intensity characteristic of the optical carrier signal comprises the phase of the optical carrier signal.

25. (Original) The optical information signal of Claim 23, wherein the non-intensity characteristic of the optical carrier signal comprises the frequency of the optical carrier signal.

26. (Original) A method for transmitting information in an optical communication system, comprising:

modulating one of a phase and frequency of each of a plurality of wavelength distinct carrier signals with a data signal to generate an optical information signal;

multiplexing the optical information signals to generate a wavelength division multiplex (WDM) signal;

transmitting the WDM signal over an optical link; and

amplifying the WDM signal in the optical link using distributed Raman amplification (DRA) with a co-launch pump signal traveling in the same direction as a WDM signal and a counter-launch pump signal traveling in an opposite direction as the WDM signal.